

INVESTMENT DECISIONS

Handout # 2

Ellison Products

As per the given information, it is quite understandable that the company has developed a new product and has already calculated the NPV for the same, which turns out to be positive \$ 3 Mn.

But if we look further, we can understand that there is an existence of externality (in this case, CANNIBALIZATION) as the launch of this new detergent, which hamper the sales of company's existing detergent.

But while calculating the NPV, this loss of sale on existing product has not been considered. So we have to adjust the NPV accordingly.

With respect to the information, the company will lose \$ 500,000/- each year for the next 10 years, so we have to calculate the Present Value of these future cash losses (the method of calculating PV remains the same)

Time Period	Cash Flow	Discounting Factor @ 10%	Discount Cash Flows / Present Value of Future
1	(500,000)	0.9091	(454,545)
2	(500,000)	0.8264	(413,223)
3	(500,000)	0.7513	(375,657)
4	(500,000)	0.6830	(341,507)
5	(500,000)	0.6209	(310,461)
6	(500,000)	0.5645	(282,237)
7	(500,000)	0.5132	(256,579)
8	(500,000)	0.4665	(233,254)
9	(500,000)	0.4241	(212,049)
10	(500,000)	0.3855	(192,772)
Total PV of FCF			(3,072,284)

Existing NPV	\$3,000,000
PV of FCF (loss due to cannibalization)	(\$3,072,284)
NPV	(\$72,284)

Since the actual NPV (after considering the affect of externalities, is negative. There is no point in going ahead with the product because (a) you are not creating value (b) you are risking the market of your existing product which might further damage the brand's reputation

Question # 3: Part A - Blink Inc.

Project A (LATIN AMERICA)			
Time Line	Cash Flows	Discount Factor @ 10%	Present Value of Future Cash Flows
1	312,000	0.9091	283,636
2	312,000	0.8264	257,851
3	312,000	0.7513	234,410
4	312,000	0.6830	213,100
5	312,000	0.6209	193,727
6	290,000	0.5645	163,697
7	300,000	0.5132	153,947
Total PV of FCF			1,500,370
Initial Investment			(1,300,000)
NPV			200,370
IRR			14.59%

Project B (AFRICA)			
Time Line	Cash Flows	Discount Factor @ 10%	Present Value of Future Cash Flows
1	480,000	0.9091	436,364
2	480,000	0.8264	396,694
3	480,000	0.7513	360,631
4	480,000	0.6830	327,846
5	480,000	0.6209	298,042
6	480,000	0.5645	270,947
7	480,000	0.5132	246,316
Total PV of FCF			2,336,841
Initial Investment			(2,200,000)
NPV			136,841
IRR			11.87%

Since the projects are Independent, the company can choose both of them as each has a positive NPV.

Question # 3: Part -b

In this question we need to calculate the NPV of opting for Lease (note that in lease here there is no initial investment)
Another important to understand is that the payment of lease rentals are at the start of the year hence the cash flows will be considered as N-1 i.e. for 1st year the cash flow will be taken on 0, for 2nd year at year 1 so on and so forth.

Also, lease rentals are also considered to be an allowed expense for tax purposes and hence will attract tax savings.
This is something you need to realize that tax is paid in arrears and hence the savings will also come in arrears.

Although we take the cash flow as N-1, the tax saving will start from year 2. The reason? The reason is simple, as per accounting records expense of LEASE RENTAL occurs in YEAR 1 (not 0), so its actual tax saving will come the next year.

	0	1	2	3	4	5
Lease Rentals	(36,000)	(36,000)	(36,000)	(36,000)		
Tax Savings due to Lease Rentals (W-1)			10,800	10,800	10,800	10,800
Net Cash Flows	(36,000)	(36,000)	(25,200)	(25,200)	10,800	10,800
Discount Factor @ 10%	1	0.9091	0.8264	0.7513	0.6830	0.6209
Present Value of FCF	(36,000)	(32,727)	(20,826)	(18,933)	7,377	6,706

Total Present Value of FCF	(94,404)
Initial Investment	-
NPV	(94,404)

Working 1 (W-1)

	Lease Rental	Tax Saving @ 30%
1	36,000	
2	36,000	10,800
3	36,000	10,800
4	36,000	10,800
5		10,800

Question # 4

In this question, the information states that a company wants to acquire a new machinery. It has two options either the company can take out a loan and then buy the machinery or the company can lease the same. We have to check which option will be the most beneficial for the company using NPV/DCF Technique

So let's look at the information and options one by one

	0	1	2	3	4	5	6
Cash Flows	-	-	-	-	-	-	-
Tax Saving Due to Depreciation (W-1)	-	-	480,000	360,000	270,000	202,500	607,500
Net Cash Flows	-	-	480,000	360,000	270,000	202,500	607,500
Discount Factor @ 7.98% (W-2)	1	0.9261	0.8577	0.7943	0.7356	0.6812	0.6309
Present Value of FCF	-	-	411,675	285,938	198,605	137,946	383,254

Total Present Value OF FCF	1,417,418
Initial Investment	(6,400,000)
NPV	(4,982,582)

Working 1 (W-1)

	Asset Book Value	Depreciation @ 25% Reducing	Tax Saving @ 30% owing to Depreciation
1	6,400,000	1,600,000	
2	4,800,000	1,200,000	480,000
3	3,600,000	900,000	360,000
4	2,700,000	675,000	270,000
5	0	2,025,000	202,500
6			607,500

Note: In year 5th, we took the entire Book Value (i.e. 2,700,000-675,000) as depreciation. Reason? Since the asset at the end of its useful life does not have any SCARP value. So at the end of year 5, its value should be 0 so in order to do that, we have to take the entire book value remaining in the last year as Depreciation expense

The concept of tax savings on depreciation remains the same.

Working 2 (W-2)

Note that the discount rate is giving as "COST OF BORROWING" i.e. K_d and it is explicitly mentioned that it is PRE-TAX. Since borrowing attracts tax shield, and we already understand that K_d is always taken as $K_d(1-t)$

Hence, $11.4\% (1-0.3) = 7.98\%$

Option # 2 - Lease Out

Again, in lease there is no initial investment. The rentals of lease are to be paid in advance

	0	1	2	3	4	5	6
Lease Rental	(1,420,000)	(1,420,000)	(1,420,000)	(1,420,000)	(1,420,000)		
Tax Savings due to Lease Rentals (W-1)	0	0	426,000	426,000	426,000	426,000	426,000
Net Cash Flows	(1,420,000)	(1,420,000)	(994,000)	(994,000)	(994,000)	426,000	426,000
Discount Factor @ 7.98% (W-2)	1	0.9261	0.8577	0.7943	0.7356	0.6812	0.6309
Present Value of FCF	(1,420,000)	(1,315,058)	(852,511)	(789,508)	(731,161)	290,197	268,751

Total of Present Value of FCF	(4,549,290)
Initial Investment	0
NPV	(4,549,290)

Working 1 (W-1)

	Lease Rentals	Tax Savings @ 30%
1	1,420,000	
2	1,420,000	426,000.0
3	1,420,000	426,000.0
4	1,420,000	426,000.0
5	1,420,000	426,000.0
6		426,000.0

Same concept as given in question 3 regarding cash flows & tax saving

CONCLUSION: IT will be cheaper for the company to opt for Leasing option, since the NPV using lease is lower (i.e. it will result in lesser cash outflow) compared to taking a loan and buying the asset.